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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,022	07/30/2003	Daniel Edward Bowen III	DN2003-127	7760

7590 05/03/2005

The Goodyear Tire & Rubber Company  
Patent & Trademark Department  
D/823  
1144 East Market Street  
Akron, OH 44316-0001

EXAMINER

COSTALES, SHRUTI S

ART UNIT PAPER NUMBER

1714

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/630,022

Applicant(s)

BOWEN ET AL.

Examiner

Shruti S. Costales

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Oath/Declaration***

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because the document sets forth a title of "PROCESS FOR PREPARING A SILICA/RUBBER BLEND" whereas the specification sets forth a title of "PROCESS FOR PREPARING A SILICA RUBBER BLEND". The two titles are not the same.

The applicant must provide a substitute with a title consistent with the specification.

### ***Specification***

2. The abstract of the disclosure is objected to because it does not meet the requirement of being 50 to 150 words in length. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly

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those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of *50 to 150 words [Emphasis Added]*. *It is important that the abstract not exceed 150 words in length* since the space provided for the abstract on the computer tape used by the printer is limited *[Emphasis Added]*. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The title of the invention is objected to because (1) it is not consistent with the title set forth in applicant's oath and (2) is not descriptive. Applicant's oath sets forth a title of "PROCESS FOR PREPARING A SILICA/RUBBER BLEND" whereas the specification sets forth a title of "PROCESS FOR PREPARING A SILICA RUBBER

BLEND". A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "A process for preparing a silica/rubber blend which includes dispersing silica, a silica coupling agent, and a low molecular weight end-group functionalized diene rubber throughout a cement of a conventional rubbery polymer, and subsequently recovering the silica/rubber blend from an organic solvent".

#### ***Claim Objections***

4. Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form. More particularly, claim 16 improperly depends from claim 21 as claim 21 is (1) not a preceding claim, and (2) no such claim exists. It is the Examiner's understanding that applicant meant for claim 16 to depend from claim 1 and not claim 21. For purposes of examination, the Examiner has assumed that claim 16 depends from claim 1. Appropriate correction by the applicant is required.

5. Claims 2-19 are objected to because the cited claims improperly recite "A process as specified...", wherein the process being referred to has already been originally described in independent claim 1 from which all the cited claims directly or

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indirectly depend from. Therefore, as there is sufficient antecedent basis for the "process" being referred to, it is suggested that applicant amend the cited claims to recite "The process as specified...". Appropriate correction by the applicant is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More particularly, claim 1 recites the limitation "the organic solvent" at line 4 of claim 1. There is insufficient antecedent basis for this limitation in the claim. It is the Examiner's understanding that silica, a silica coupling agent, and low-molecular weight end-group functionalized diene rubber, are dispersed throughout a cement of a conventional rubbery polymer present in a solution, therefore allowing recovery of silica/rubber blend from the organic solvent. Appropriate correction by the applicant is required.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-5 and 7-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Visel et al. (U.S. Patent Number 6,359,034), hereinafter referred to as Visel, in view of the evidence set forth by Asahara et al. (U.S. Patent Number 5,532,319), hereinafter referred to as Asahara.

Visel discloses a method of preparing an elastomer/silica composite as a dispersion of a filler formed in-situ within an elastomer host via a condensation reaction of tetraethoxysilane (TEOS) and an additional organosilane, by (A) blending with an organic solvent solution of at least one diene hydrocarbon based elastomer containing 100 parts by weight (phr) of said elastomer; (1) an organic solvent solution of said TEOS containing about 0.5 to about 50, alternately about 5 to about 30, phr of said TEOS; (2) an organic solvent solution of said additional organosilane containing about 0.5 to about 25 phr of said organosilane; (3) a catalytic amount of condensation reaction promoter for said TEOS and said additional organosilane and a sufficient amount of water to facilitate said condensation reaction, followed by (B) recovering a composite of said elastomer and dispersion therein of an in situ formed condensation reaction product of said TEOS and additional organosilane; wherein said blending process

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includes (1) substantially simultaneously blending said TEOS solution and said additional organosilane solution with said elastomer solution following which said condensation promoter and water are added, or (2) first blending said TEOS solution with said elastomer solution, following which said condensation promoter and water are added and subsequently blending said additional organosilane solution therewith (Col. 2, lines 30-60 and see Col. 1, lines 41-45). It is to be noted that a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

It is disclosed that the elastomer is preferably selected from at least one of homopolymers of conjugated dienes, copolymers of conjugated dienes, copolymers of conjugated diene with a vinyl aromatic compound, preferably selected from styrene and alpha-methylstyrene and more preferably styrene (Col. 3, lines 28-33). Further, Visel discloses that a relatively small size, homogeneous dispersion of silica particles is encouraged by the process of this invention because it is contemplated that very small, nanoparticle size (e.g. about 5 to about 25 nanometers average diameter particle size) silica particles can be achieved which promote a better dispersion, compatibility and interaction within the elastomer host (Col. 4, lines 26-32).

Visel also discloses that based on 100 phr of elastomers, about 10 to about 90 phr of at least one diene-based elastomer is added, about 90 to about 10 phr of at least

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one pre-formed composite of elastomer/filler is added, 30 to about 120 phr of at least one additional reinforcing filler such as precipitated silica is added, and optionally a coupling agent is added (Col. 5, lines 20-44). Therefore, based on 100 phr of elastomers, it is the Examiner's understanding that the coupling agent would be present in an amount of between 0 to 50 phr. Further, Visel discloses that the diene-based elastomer(s) are contemplated as being selected from, for example, homopolymers and copolymers of monomers selected from isoprene and 1,3-butadiene and copolymers of monomers selected from at least one of isoprene and 1,3-butadiene with an aromatic vinyl compound selected from styrene and alpha-methylstyrene, preferably styrene, and mixtures thereof (Col. 6, lines 1-7). At least one of the non-productive mixing stages occurs at a temperature of between 140° C and 190° C (Col. 9, lines 33-36). Visel does not expressly disclose the molecular weight of the functionalized diene elastomer terminated with a tetraalkoxysilane, however, Asahara discloses that the molecular weight of a rubber polymer treated with tetramethoxysilane has a molecular weight of 70,000 (Col. 14, lines 63-67; Col. 15, lines 1-5; and Table 2).

In view of the above discussion, it is clear that the presently cited claims are anticipated.

9. Claims 1, 3-5, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Materne et al. (U.S. Patent Number 6,166,108), hereinafter referred to as Materne.

Materne discloses a composition prepared by blending a filler precursor, condensation reaction promoter and elastomer host selected from elastomer host (A) and elastomer host (B), in a medium of (1) an organic solvent solution of said elastomer host or (2) an aqueous latex of said elastomer host, preferably in an organic solvent solution, to initiate a condensation reaction of said filler precursor and, for elastomer host (A), and optionally for elastomer host (B), subsequently adding and reacting an organosilane material with said filler/filler precursor prior to the completion of said condensation reaction; followed by recovering the resulting elastomer/filler composite, wherein the aqueous latex of said elastomer host corresponds to the cement of a conventional rubbery polymer in the presently cited claims (Col. 2, lines 25-36). The elastomer host (A) is selected from at least one of homopolymers of conjugated dienes, copolymers of conjugated dienes, copolymers of conjugated diene with a vinyl aromatic compound, preferably selected from styrene and alpha-methylstyrene and more preferably styrene and the elastomer host (B) is selected from at least one alkoxy metal end functionalized diene-based elastomer (Col. 2, lines 56-65). In particular, 1,3-butadiene and styrene may be used (Col. 5, lines 35-39). See *In re Hirao and Kropa v. Robie* discussed above.

The filler precursor material examples include methyl triethoxy silicate, di-s-butoxyaminoxy triethoxysilane, bis(triethoxysilyl) methane, etc. (Col. 6, lines 1-10). The organosilane material includes bis(3-alkoxysilylalkylpropyl) disulfide (Col. 6, lines 38-67 and Col. 7, lines 1-46). An additional bifunctional coupling agent – eg: an organosilane polysulfide may be added to the above composition to aid in bonding the

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in-situ synthesized filler to the elastomer (Col. 5, lines 5-7). Further, it is disclosed that it has been heretofore proposed to create a dispersion of silica in polysiloxane polymers such as poly(dimethylsiloxane), or (PDMS), elastomer(s) by in-situ formation of silica from a base-catalyzed sol-gel conversion of tetraethoxysilane (TEOS) (Col. 1, lines 36-45; see also Col. 16, lines 5-8).

It is also disclosed that additional silica, particularly precipitated silica may be blended with the composition, wherein various commercially available precipitated silicas may be considered for use such as Hi-Sil® 210 (Col. 13, lines 13-43). Also, in one of the mixing stages the temperature is allowed to reach a temperature of between 140° and 190° C (Col. 15, lines 21-24). Further, the components of the above composition may be mixed in three separate stages of addition at temperatures of 170° C, 160° C, and 120° C, wherein the cooling of the mixture occurs at 30° C or lower (Col. 21, lines 42-53).

In light of the above discussion, it is clear that the presently cited claims are anticipated.

10. Claims 1-12 and 14-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Lin et al. (U.S. Patent Number 6,608,145), hereinafter referred to as Lin, in view of Asahara.

Lin discloses a sulfur-vulcanizable elastomeric compound, comprising an elastomer polymerized in solvent, a reinforcing filler comprising silica or a mixture

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thereof with carbon black, a silica dispersing agent, a bis(trialkoxysilylorgano) tetrasulfide silica coupling agent, and a cure agent (Col. 3, lines 58-63 and Col. 11, lines 4-7). The sulfur-vulcanizable elastomeric compound is formed by mixing the elastomer, the silica, the bis(trialkoxysilylorgano) tetrasulfide silica coupling agent, and the silica dispersing aid (Col. 4, lines 1-4). The solvent is removed from the polymer or elastomer or rubber using conventional techniques (Col. 11, lines 26-30 and Col. 3, lines 9-10).

See *In re Hirao* and *Kropa v. Robie* discussed above.

Further, Lin discloses that the elastomer such as styrene-butadiene rubber are terminated with a tetraethoxysilane (TEOS) functionalizing agent to produce a TEOS-terminated polymer (Col. 14, lines 39-40). Silica dispersing agents such as alkyl alkoxysilanes may be used (Col. 2, lines 37-38). It is also disclosed that although the bis(trialkoxysilylorgano) tetrasulfides having methoxysilane groups can be used, it is preferred for environmental reasons that ethoxysilanes are employed, rather than methoxysilanes, because ethyl alcohol, rather than methyl alcohol, will be released when the alkoxysilane portion of the coupling agent reacts with the surface of the silica particle (Col. 4, lines 59-65).

The various components of sulfur-vulcanizable elastomeric compound are added at a temperature of 165° C to about 200° C and in a final mixing step the temperature is within a preferred range of about 40° C to about 120° C (Col. 7, lines 60-67 and Col. 8, lines 1-41). Lin also discloses that the rubbers useful in the invention include synthetic polyisoprene rubber, styrene-butadiene rubber (SBR), styrene-isoprene-butadiene rubber, styrene-isoprene rubber, butadiene-isoprene rubber, polybutadiene, butyl

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rubber, neoprene, ethylene-propylene rubber, ethylene-propylene-diene rubber (EPDM), acrylonitrile-butadiene rubber (NBR), silicone rubber, the fluoroelastomers, ethylene acrylic rubber, ethylene vinyl acetate copolymer (EVA), epichlorohydrin rubbers, chlorinated polyethylene rubbers, chlorosulfonated polyethylene rubbers, hydrogenated nitrile rubber, tetrafluoroethylene-propylene rubber and the like (Col. 12, lines 31-43). More particularly, Lin discloses that 1,3-diene monomers are polymerized (Col. 9, lines 65-66) inherently including 1,3-butadiene.

Precipitated silica is present in an amount of about 5 to about 80 phr (Col. 7, lines 18-22). The silica coupling agent, more particularly Si69® as indicated at Col. 3, lines 8-9, is present in an amount of 0 to 3 phr (see Table 5 at the bottom of Col. 16). Resins can be used in an amount of 1 to 50 phr (Col. 13, lines 19-29). Lin does not expressly disclose the molecular weight of the functionalized diene rubber terminated with a tetraalkoxysilane, however, Asahara discloses that the molecular weight of a rubber polymer treated with tetramethoxysilane has a molecular weight of 70,000 (Col. 14, lines 63-67; Col. 15, lines 1-5; and Table 2).

In light of the above discussion, it is clear that the presently cited claims are anticipated.

11. Claims 1 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Agostini et al. (U.S. Pre-Grant Publication Number 2003/0069332), hereinafter referred to as Agostini.

The applied reference has a common assignee "The Goodyear Tire & Rubber Company" with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Agostini discloses that an elastomer/filler reinforcement composite is comprised of a dispersion of said filler reinforcement formed in-situ within said elastomer host prepared by a method which comprises: (A) blending an organic solution of a co-solvent and a phase transfer agent with an organic solution of a diene hydrocarbon based elastomer host wherein said elastomer is selected from elastomer host (1) and/or elastomer host (2); (B) thereafter blending therewith a filler precursor (C) thereafter blending therewith at least one condensation reaction promoter to promote a condensation reaction of said filler precursor; (D) optionally blending therewith an organosilane prior to the completion of said condensation reaction; and (E) recovering the resulting elastomer/reinforcing filler composite (Page 1, paragraphs [0013]-[0018]). See *In re Hirao and Kropa v. Robie* discussed above.

Further, the elastomer host is selected from at least one of homopolymers of conjugated dienes, copolymers of conjugated dienes, copolymers of conjugated diene with a vinyl aromatic compound, preferably selected from styrene and alpha-methylstyrene and more preferably styrene and mixtures of such polymers and

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copolymers (Pages 1 and 2, paragraph [0019]). More particularly, at least one diene-based elastomer selected from at least one homopolymer and copolymer of isoprene and 1,3-butadiene and copolymer of at least one diene selected from isoprene and 1,3-butadiene with a vinyl aromatic compound selected from at least one of styrene and alpha-methylstyrene, preferably styrene are disclosed by Agostini (Page 4, paragraph [0067]).

It is also disclosed that precipitated silica may be added to said composite (Page 3, paragraph [0050]). Also, Agostini discloses in-situ creation, with the aid of a phase transfer agent/co-solvent combination, of a prescribed filler material, within an alkoxy metal end-functionalized elastomer host, which has a moiety (for example, a trialkoxysilyl or trialkoxytitanyl-moiety) for coupling the elastomer with polar fillers synthesized in-situ and which can, therefore, reduce the need of subsequently adding an additional bifunctional coupling agent, e.g. an organosilane polysulfide, to aid in bonding the in-situ synthesized filler to the elastomer (Page 3, paragraph [0048]).

In view of the above discussion, it is clear that the presently cited claims are anticipated.

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
13. Claims 2 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Asahara.

The discussion above regarding Lin and Asahara in paragraph 10 is herein incorporated by reference.

Lin discloses a sulfur-vulcanizable elastomeric compound, comprising an elastomer polymerized in solvent, a reinforcing filler comprising, a silica dispersing agent, a bis(trialkoxysilylorgano) tetrasulfide silica coupling agent, and a cure agent (Col. 3, lines 58-63 and Col. 11, lines 4-7), wherein the elastomer such as styrene-butadiene rubber are terminated with a tetraethoxysilane (TEOS) functionalizing agent to produce a TEOS-terminated polymer (Col. 14, lines 39-40). Although Lin does not disclose explicitly the molecular weight of the functionalized diene rubber terminated with a tetraalkoxysilane, Asahara discloses that the molecular weight of a rubber polymer treated with tetramethoxysilane has a molecular weight of 70,000 (Col. 14, lines 63-67; Col. 15, lines 1-5; and Table 2).

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It would have been obvious to one skilled in the art to use Asahara's rubber polymer treated with tetramethoxysilane having a molecular weight of 70,000 with Lin's compound because such a composition has high holding power and good heat resistance (Col. 17, lines 30-31 of Asahara) thereby obtaining the invention as set forth in claims 2 and 17 of the present invention.

14. Claims 4, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Reddy et al. (U.S. Pre-Grant Publication Number 2004/0162399), hereinafter referred to as Reddy.

The discussion above regarding Lin in paragraph 10 is herein incorporated by reference.

Lin discloses a sulfur-vulcanizable elastomeric compound, comprising an elastomer polymerized in solvent, a reinforcing filler comprising, a silica dispersing agent, a bis(trialkoxysilylorgano) tetrasulfide silica coupling agent, and a cure agent (Col. 3, lines 58-63 and Col. 11, lines 4-7), wherein the elastomer such as styrene-butadiene rubber are terminated with a tetraethoxysilane (TEOS) functionalizing agent to produce a TEOS-terminated polymer (Col. 14, lines 39-40). Although Lin does not disclose explicitly tetramethoxysilane for use as a functionalizing agent, Reddy discloses a silicone-acrylate impact modifier composition having tetraalkoxysilane type silicone rubber monomers including tetramethoxysilane and tetraethoxysilane (Page 1, paragraph [0003] and Page 3, paragraphs [0017]-[0018] of Reddy).

It would have been obvious to one skilled in the art to use the tetraalkoxysilane type silicone rubber monomers including tetramethoxysilane and tetraethoxysilane of Reddy with Lin's compound to obtain superior impact properties, lower ductile-to-brittle transition temperatures, and outstanding weatherability performance for use in outdoor applications (Page 1, paragraph [0002] of Reddy), thereby obtaining the invention as set forth in claims 4, 5, and 6 of the present invention.

15. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Sandstorm et al. (U.S. Patent Number 6,378,582), hereinafter referred to as Sandstorm.

The discussion above regarding Lin in paragraph 10 is herein incorporated by reference.

Lin discloses a sulfur-vulcanizable elastomeric compound, comprising an elastomer polymerized in solvent, a reinforcing filler comprising, a silica dispersing agent, a bis(trialkoxysilylorgano) tetrasulfide silica coupling agent, and a cure agent (Col. 3, lines 58-63 and Col. 11, lines 4-7), wherein a method for preparing such compound is disclosed. Attention is drawn to Col. 3, lines 51-54 and Col. 14, lines 5-16 where Lin specifically discloses a pneumatic tire "having a component" made from Lin's compound. It is reasonable to presume that a tire tread is encompassed by the disclosure of such a component. Hence Lin meets a tire tread made from a sulfur-vulcanizable elastomeric compound. With respect to the tire itself, although Lin does

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not disclose explicitly a tire having a specific structure as recited in claim 20 of the present invention, Sandstorm discloses a tire which is comprised of a generally toroidal-shaped carcass with an outer circumferential tread, two spaced beads, at least one ply extending from bead to bead and sidewalls extending radially from and connecting said tread to said beads wherein said tread is adapted to be ground-contacting (Col. 5, lines 29-35 of Sandstorm).

It would have been obvious to one skilled in the art to use the specific tire structure disclosed by Sandstorm with Lin's compound because the resulting tire would offer an excellent combination of traction, treadwear, and rolling resistance characteristics (Col. 5, lines 14-16 of Sandstorm), thereby obtaining the invention as set forth in claim 20 of the present invention.

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hamada (U.S. Patent Number 5,409,969) discloses a rubber composition for a pneumatic tire having a silica filler, at least one specified silane coupling agent, and a particular polymer rubber. Penot (U.S. Pre-Grant Publication Number 2003/0105242) discloses a rubber composition useful for the manufacture of tires, where the composition is based on a diene elastomer, a reinforcing inorganic filler, and a coupling system, wherein the coupling system includes a polysulfurized

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alkoxysilane coupling agent (inorganic filler/diene elastomer) associated with an aldimine.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shruti S. Costales whose telephone number is (571) 272-8389. The examiner can normally be reached on Monday - Friday, 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

Shruti S. Costales  
April 29, 2005

*Vasu Jagannathan*  
VASU JAGANNATHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700